



(OLA #:025-03 and 029-03)

**NOT FOR CIRCULATION**

**REVISED DRAFT-- LEGISLATIVE ANALYST REPORT**

**To:** Members of the Board of Supervisors  
**From:** Adam Van de Water, Office of the Legislative Analyst  
**Date:** October 21, 2003  
  
**RE:** Cell Phone Antennae (File #031284 and 031411)

**SUMMARY AND SCOPE OF WORK**

Supervisors Ma and Sandoval introduced separate motions requesting the Office of the Legislative Analyst (OLA) research issues related to the siting of cellular phone antennae. Supervisor Ma requested that the OLA research model municipal practices with respect to establishing appropriate and/or shared sites for cellular antennas. Supervisor Sandoval requested that the OLA review, analyze, and make recommendations to the Board of Supervisors regarding the feasibility of enacting a cell phone antennae installation moratorium until the City reviews and updates the existing Planning Department's Wireless Telecommunications Services Facilities Guidelines (the "Guidelines").

**EXECUTIVE SUMMARY**

The San Francisco Planning Commission (the "Commission") adopted a comprehensive set of guidelines for siting wireless telecommunications antennae in 1996. While comprehensive when compared to those of other surveyed jurisdictions, the guidelines have attracted considerable public protest due to the high concentration of antennae in San Francisco and the fear that they will reduce property values and harm public health. As a result, according to attorneys and planners in other jurisdictions, San Francisco is frequently cited as both a model (for its comprehensive guidelines) and a warning (for the extensive regulatory process required to erect an antenna).

Section 4.105 of the Charter and Section 308.1(b) of the Planning Code require the Board of Supervisors to hear Conditional Use (CU) Permit appeals and require a two-thirds vote of the Board to overturn the Commission's decision. However, the Telecommunications Act of 1996 imposes significant restraints on the City's regulation of wireless facilities. Among other things, the Act specifically prohibits the Board from disapproving antennae for public health concerns or denying a permit without "substantial evidence" in a written record. The City retains local land

use authority and can regulate the height, location, visual impact, and/or zoning compliance of a new antenna.

Some courts have upheld temporary moratoria on new antenna construction under the Act while others have struck them down. However, nothing in the Act prevents the City from prohibiting wireless carriers from using city-owned property for their facilities. Please consult the City Attorney's Office for more information on court interpretations of the Telecommunications Act.

With demand for wireless antennae construction and public concern of their health impacts continuing to grow, the Board may wish to pass a resolution urging the Planning Department to revise the Wireless Telecommunications Services Facilities Guidelines as well as propose a fee to pay for the revisions. Among the revisions the Planning Department should consider are:

- require wireless providers to pay for periodic scientific measurement of radiofrequency (RF) radiation and service coverage by independent consultants selected by the Planning Department (as currently authorized in Sections HS1 and CI2 of the Guidelines),
- explicitly define "adequate coverage" and "adequate capacity" and require wireless service providers to demonstrate that existing antennae do not allow them to meet them,
- improve neighborhood notification requirements by further standardizing public notice mailings and requiring public meetings to be held two weeks in advance of the CU hearing,
- include provisions to indemnify the City from claims alleged to result from the environmental effects of RF radiation,
- protect wireless service providers from the public release of trade secret or other proprietary information,
- coordinate with the Metropolitan Transportation Authority and the Department of Public Works to mount antennae on city-owned MUNI or utility poles in high-density corridors,
- require consideration of (or higher Preferred Location of) lower-power repeaters or microcells to fill holes in service delivery prior to approval of any new antennae,
- require consideration of all possible means to share antennae bandwidth with other wireless service providers prior to approval of any new antennae, and/or
- re-examine the seven preference location sites in Section 8.1 of the Guidelines to ensure, for instance, that a publicly-owned building in a residential district is not necessarily preferred over a mixed-use building in a high-density district.

### **THE BASICS: HOW CELLULAR ANTENNAE WORK**

Cellular phone facilities typically consist of three primary parts: the antenna, the base station, and the equipment. Typical antennae measure approximately four feet in height and six inches in width and are designed to send and receive signals to and from cellular phones (low-power, single channel, two-way radios). They do this using radiofrequency (RF) radiation at frequencies between 800 and 1990 megahertz (MHz). This is a low-power transmission greater than FM radio, cordless telephone, and television broadcasts of approximately 100 MHz and less than microwave oven frequencies of approximately 2,450 MHz.

Antennae are typically mounted on an existing building or separate structure (the “base station”) well above street level to both minimize public exposure to the RF radiation and maximize cellular transmission. Signals sent and received by the antenna are transmitted through cables to be converted into local landlines by equipment typically installed inside the building or at the base of the station.

The Planning Department estimates that there are 463 base station sites in San Francisco and as many as 2,400 cell phone antennae citywide (many stations have two to four antennae per site)<sup>1</sup>.

### **HOW CELLULAR ANTENNAE ARE REGULATED**

#### ***Federal Law***

Section 704 of the Telecommunications Act of 1996 states that state and local governments cannot:

- i. “unreasonably discriminate among providers of functionally equivalent services”<sup>2</sup>;
- ii. “prohibit or have the effect of prohibiting the provision of personal wireless services.”<sup>3</sup>; or
- iii. “regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the [Federal Communications] Commission’s regulations concerning such emissions.”<sup>4</sup>

Furthermore, any request for authorization to place, construct or modify a wireless facility must be acted on “within a reasonable period of time”<sup>5</sup> and any denial must be “in writing and supported by substantial evidence contained in a written record.”<sup>6</sup>

#### ***The Federal Communications Commission (FCC)***

The FCC allocates service providers specific frequencies on the electromagnetic spectrum and sets the safety standard for public exposure to RF radiation.

The current safety standard – developed in 1996 in a collaboration between government, the scientific community, industry associations, and the public – limits public exposure levels to approximately two percent of the level where replicated biological effects (cataracts, skin burns, deep burns, heat exhaustion and heat stroke) have been observed<sup>7</sup>. According to the Institute of

<sup>1</sup> Telephone interview with Jonas Ionin, SF Planning Department 8/29/03.

<sup>2</sup> 47 U.S.C. §332(c)(7)(B)(i)(I)

<sup>3</sup> 47 U.S.C. §332(c)(7)(B)(i)(II)

<sup>4</sup> 47 U.S.C. §332(c)(7)(B)(iv)

<sup>5</sup> 47 U.S.C. §§332(c)(7)(B)(ii).

<sup>6</sup> 47 U.S.C. §§332(c)(7)(B)(iii).

<sup>7</sup> John E. Moulder, Ph.D. “Cellular Phone Antennas (Mobile Phone Base Stations) and Human Health”, Medical College of Wisconsin. FCC limits are currently set at 0.57 mW/cm<sup>2</sup> at 900 MHz and 1.0 mW/cm<sup>2</sup> at 1800-2000 MHz. Replicated biological effects have been observed at 40 mW/cm<sup>2</sup>.

Electrical and Electronics Engineers (one of the co-creators of the FCC's public exposure safety guidelines),

*In nearly all circumstances, public exposure to RF fields near wireless base stations is far below recommended safety limits... Consequently, wireless base stations are not considered to present a risk to the general population including aged people, pregnant women and children<sup>8</sup>.*

The long-term effects of RF radiation, however, are poorly documented and the scientific community widely disagrees on the public health impacts of continued exposure to RF radiation.

### ***The Planning Code***

The Planning Code permits cellular antennas and base stations as a Principal Use in Commercial and Industrial Districts when they meet certain height and location requirements. If the antennas do not meet these requirements or if they are located in Residential or mixed Residential-Commercial Districts, they can still be approved by the Planning Commission as Conditional Uses (CUs)<sup>9</sup>.

Per Section 308.1(b) of the Planning Code, Planning Commission approval or denial of a Conditional Use permit for new cell phone antennae construction can be appealed to the Board of Supervisors within 30 calendar days of the Planning Commission's decision for a fee of \$275. As of the writing of this report, the Board of Supervisors has upheld the last six CU appeals for wireless antennae.

### ***The Planning Department and Commission***

The Planning Department has the authority to regulate new cell phone antenna construction on the basis of neighborhood compatibility, aesthetic design, and compliance with height restrictions and the General Plan. The Planning Code and the 1996 Wireless Telecommunications Services Facilities Siting Guidelines ("Guidelines") form the basis for the Planning Commission's consideration of new cell phone antenna construction.

Section 8.1 of the Guidelines establishes preferred location sites for new antennae CU approval and ranks them by priority siting. In order, they are:

#### **Preferred Location Sites**

1. Publicly-Used Structures (police or fire stations, libraries, utility structures, etc.)
2. Co-location Sites (until it resembles an "antennae farm" or "is otherwise deemed visually obtrusive")

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<sup>8</sup> Safety Issues Associated with Base Stations Used for Personal Wireless Communications, A COMAR Technical Information Statement. IEEE Eng Med Biol. Mar/Apr 2001, pp. 110-114. Online at: <http://ewh.ieee.org/soc/embs/comar/base.htm>.

<sup>9</sup> Certain lower power antennae (so-called 'microcells') can qualify for a third category – Accessory Use – at the discretion of the Zoning Administrator. Accessory Use permits are not subject to formal public notification procedures.

3. Industrial or Commercial Structures (where other visual obstructions/clutter are removed as part of the installation)
4. Industrial or Commercial Structures (with NO removal of visual obstructions/clutter)
5. Mixed Use Buildings in High Density Districts (if good faith efforts were made to first secure a preferred location site above)

#### **Limited Preference Sites**

6. Buildings in Neighborhood Commercial Districts (if good faith efforts were made to first secure a preferred location site above)

#### **Disfavored Sites**

7. Buildings in Zoned Residential Districts (must demonstrate “clear and convincing evidence” of good faith efforts to first secure a preferred location site above and demonstrate that the location is “essential to meet demands in the geographic service area.”<sup>10</sup>)

As part of the application process, service providers must also:

- Show that new antennae and base equipment satisfy local noise ordinances, minimize visual impacts and thermal transmissions, avoid or minimize intrusion into usable open space, and provide barriers and signage to prevent persons from passing within the safety limits established by the FCC-adopted standards;
- Provide Five Year Facilities Plans indicating the location, frequency, and type of technology of each existing and proposed antenna;
- Estimate cumulative RF emissions;
- Provide mailing labels for owners and tenants within a 500-foot radius of the proposed location for public notification purposes; and
- Prepare a Program Implementation Report showing the results of RF emissions tests.

### **IMPOSING MORATORIA**

In response to a petition filed with the FCC by the Cellular Telecommunications Industry Association (“CTIA”), the FCC’s Local and State Government Advisory Committee met with CTIA and other wireless industry trade associations to discuss best practices for siting new antenna facilities. On August 5, 1998 they agreed to guidelines that dealt with informal dispute resolution and moratoria. According to the guidelines,

*Moratoria, where necessary, may be utilized when a local government needs time to review and possibly amend its land use regulations to adequately address issues relating to the siting of wireless telecommunications facilities in a manner that addresses local concerns, provides the public with access to wireless services for its safety, convenience and productivity, and complies with the Telecommunications Act of 1996.*

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<sup>10</sup> Section 8.1, WTS Guidelines, page 30, August 15, 1996.

Smaller cities across California (Berkeley, Los Gatos, Saratoga, and Sausalito) and the nation (Mecosta County, MI, Bloomington, MN, Medina, WA) have enacted temporary moratoria on new wireless antennae. However, some courts have upheld temporary moratoria on new antenna construction under the Act while others have struck them down. Please consult the City Attorney's Office for more detail on court interpretations of the Telecommunications Act and the applicability to establishing a moratorium in San Francisco.

### **The School Districts**

City College of San Francisco does not currently have any wireless antennae on its buildings or grounds. According to Vice Chancellor Peter Goldstein, this is not due to any City College written policy but instead was the result of a breakdown in negotiations due to faculty and student health concerns as well as after hours access considerations once the buildings are locked and alarmed.

San Francisco Unified School District facilities manager Phil Smith does not believe there has ever been a district moratorium on wireless antennae and points to the current existence of antennae in two locations as evidence against any prior or existing moratorium.

### **Berkeley**

The City of Berkeley enacted a temporary moratorium (just over one year in length) on cellular antennae in 2000 in order to codify its siting guidelines into Chapter 23C.17 of the Berkeley Zoning Code. According to Deputy City Attorney Zach Cowen, the wireless industry was reasonable and "went the extra mile" to cooperate<sup>11</sup>. To date, the City has not been sued over the moratorium or the ordinance.

### **Sausalito**

The City of Sausalito enacted a temporary moratorium (approximately one and one half years) on cellular antennae in 2001 in order to codify its siting guidelines into the municipal code. The wireless industry participated in a twelve-person committee to develop the ordinance and, according to Planning Director Drummond Buckley, was cooperative throughout<sup>12</sup>.

### **San Diego**

While the full City Council never enacted it, according to Deputy City Attorney Paul Edmonson, a San Diego City Council committee issued a six-month "de facto moratorium" on conditional use permits for cellular antennae as the city underwent revision of the municipal code. The revision process was undertaken with the full cooperation of the wireless industry that participated from the beginning. According to Mr. Edmonson, the City of San Diego is currently waiting to see if a court decision against San Diego County will require any changes to their ordinance before they revise their municipal code.

<sup>11</sup> Telephone interview October 21, 2003.

<sup>12</sup> Telephone interview October 21, 2003.

### **San Diego County**

San Diego County recently enacted similar revisions to their municipal code and was subsequently sued by AT&T Wireless and Sprint Corporation for violations of the federal Telecommunications Act and the state Public Utilities Code. According to Deputy County Counsel Tom Bunton, the final judgement in the case, including any anticipated appeals, could take several years to resolve.

### **Seattle, WA**

Chapter 23.57 of the Seattle Municipal Code regulates the siting of cellular antenna in the City of Seattle, WA. Mayor Greg Nickels has introduced a draft ordinance amending Chapter 23.57 to prohibit cellular antennae in Single Family and Residential Small Lot zones in most situations. As required by federal law, the legislation would allow for rare exceptions to this prohibition, such as when a cellular antenna is located completely within a non-single family structure or when the industry can produce verifiable engineering data indicating a significant gap in cellular service.

According to Alan Justad, the Department of Planning and Development expects to issue a Rule by the end of the calendar year explicitly defining 'significant gap in service' as it pertains to strength of signal, dropped calls, dropped handoffs between antennae, and setup failure<sup>13</sup>. The draft ordinance is currently before the city council. However, as they are currently undergoing end of the year budget deliberations, Mr. Justad does not believe they will take up the matter before early 2004.

### **GUIDELINES IN OTHER JURISDICTIONS**

The OLA reviewed six jurisdictions with explicit guidelines (Santa Cruz County, Warren, CT, Great Barrington, MA, Portland, OR, Denver, CO, Seattle, WA, and West Stockbridge, MA) and found that San Francisco has one of the most comprehensive antennae siting guidelines. While many jurisdictions' have guidelines similar to San Francisco's in terms of zoning requirements, facility setbacks, co-location, signage, and compliance with the Telecommunications Act, there are a few notable differences:

- a) The **Santa Cruz County** Board of Supervisors is currently undergoing final review of their proposed Wireless Communications Facilities Ordinance and have proposed to expressly prohibit new antennae in all residential zoning districts, on the coastline, and on all public and private K-12 school sites;
- b) The City of **Seattle** has also proposed to prohibit new antennae in all residential zoning districts (see above). However, in order to remain in compliance with the Telecommunications Act, they have allowed for "rare exceptions to this prohibition such as,

<sup>13</sup> Telephone interview October 21, 2003.

when a cell antenna is located completely within a non-single family structure or when cell service cannot be provided otherwise.”<sup>14</sup>

- c) Prior to approving a permit for new antennae, the small Town of **Warren, CT** requires wireless providers to:
  - i. prove inadequate capacity or coverage,
  - ii. use lower-power repeaters where possible,
  - iii. pay for an independent consultant chosen by the town to conduct pre- and post-antenna testing,
  - iv. indemnify the town from insurance claims, and
  - v. reapply for a permit after five years.
- d) The City of **Boca Raton, FL** requires a maintenance bond in the amount of ten percent of the cost of construction of the tower “to ensure that the tower is maintained in a condition that complies with all applicable building standards and regulations” and asserts that all trade secret and proprietary information will not be released to the public unless required by law.
- e) **Great Barrington, MA** requires wireless service providers to pay for independent consultants to monitor electromagnetic fields and to provide written documentation that existing antennae do not provide adequate service<sup>15</sup> and adequate coverage<sup>16</sup>. As the courts have yet to weigh in on the legal difference between service coverage (strength of signal throughout a service area) and service capacity (including non-emergency communications such as the ability to send and receive e-mail and video), such language could play an important role in future permit applications.

### CONCLUSION & RECOMMENDATION

With demand for wireless antennae construction and public concern over those facilities continuing to grow, the Board may wish to pass a resolution urging the Planning Department to revise the Wireless Telecommunications Services Facilities Guidelines. Among the revisions the Planning Department should consider are the following:

- require wireless providers to pay for periodic scientific measurement of radiofrequency (RF) radiation and service coverage by independent consultants selected by the Planning Department (as currently authorized in Sections HS1 and CI2 of the Guidelines),
- explicitly define “adequate coverage” and “adequate capacity” and require wireless service providers to demonstrate that existing antennae do not allow them to meet them,
- improve neighborhood notification requirements by further standardizing public notice mailings and requiring public meetings to be held two weeks in advance of the CU hearing.

<sup>14</sup> Mayor Nickels’ Cellular Antenna Proposal Frequently Asked Questions on-line at [http://www.cityofseattle.net/mayor/issues/Cell\\_Antenna\\_FAQ.htm](http://www.cityofseattle.net/mayor/issues/Cell_Antenna_FAQ.htm).

<sup>15</sup> Explicitly defined as “that area surrounding a Base Station where the predicted or measured median field strength of the transmitted signal is greater than –95dBm. It is acceptable for there to be holes within the area of Adequate Coverage where the signal is less than –95dBm, as long as the signal regains its strength to greater than –95dBm further away from the Base Station.

<sup>16</sup> Defined as a Grade of Service of p.05 or better – i.e., 95 percent of calls will connect on the first try at the busiest time of day – for at least 50% of the days in a preceding month.



- include provisions to indemnify the City from claims alleged to result from the environmental effects of RF radiation,
- protect wireless service providers from the public release of trade secret or other proprietary information,
- coordinate with the Metropolitan Transportation Authority and the Department of Public Works to mount antennae on city-owned MUNI or utility poles in high-density corridors,
- require consideration of (or higher Preferred Location of) lower-power repeaters or microcells to fill holes in service delivery prior to approval of any new antennae, and
- require consideration of all possible means to share antennae bandwidth with other wireless service providers prior to approval of any new antennae, and/or
- re-examine the seven preference location sites in Section 8.1 of the Guidelines to, for instance, ensure that a publicly-owned building in a residential district is not necessarily preferred over a mixed-use building in a high-density district.

The Board should consult with the City Attorney's Office regarding any legal issues that may arise if the Board were to impose a temporary moratorium on construction of new wireless facilities while the Planning Department considers revisions to the Guidelines.

As part of the same resolution, the Board may also wish to urge the Planning Department to propose fees to be placed on new wireless facilities permits to support ongoing revisions to the Guidelines as well as compliance monitoring of existing antennae.